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NOTES ON THE FORESTS OF SOUTHEASTERN LABRADOR*

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One who has seen only the barren eastern coast of Labrador might expect a discussion of Labrador forests to rival in brevity the famous chapter on the snakes of Ireland. A cruise along the coast brings before the traveler a shore line which appears to belong to one of the most barren and treeless lands in the world. When viewing it from a distance the traveler is likely to acquiesce in Jacques Cartier's description of Labrador as "the land that God gave Cain." A short journey up any of the rivers which reach the coast of southeastern Labrador, however, will take the explorer into a densely wooded country which has no resemblance to the barren coast line and will convince him of the injustice of this description.

The coastal strip and the interior present surprising climatic contrasts which are most clearly reflected in the distribution of the forests. In passing through the Strait of Belle Isle in July a stream of floating ice and bergs is met with, which increases in volume as one proceeds up the coast. Throughout most of the month of July the vast ice fields move steadily southward under the influence of the Labrador Current, past a bleak rocky coast on which no timber can be seen (Fig. 2). The sub-Arctic climate which the southward-moving ice fields bring as far south as the Strait of Belle Isle extends but a short distance inland from the coast. In crossing the eastern threshold of the peninsula by way of Lake Melville and the "Narrows" one finds that there are two Labradors. One is a narrow coastal zone of islands and sea-facing mainland, called "the Labrador" by the cod fisherman, which is chilled by ice floes and is nearly or quite treeless. Inside this seashore strip is the heavily forested vast interior Labrador, traversed by countless streams and dotted with thousands of lakes. In this interior region salmon and trout fishing take the place of cod fishing. A summer climate replaces the ice-chilled coastal climate, and forests cover both mountains and valleys.

The observations along the coast line here recorded were made chiefly from the decks of the Newfoundland steamers, which call at the numerous fishing stations on the Labrador coast, and during a cruise on the S.S. *Acadia* to Rigolet at the entrance to Lake Melville. My earlier impressions of the coast were obtained from the deck of a sealing steamer during a cruise to the Arctic. The notes relating to the interior are based on a launch-and-

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canoe trip covering a few hundred miles of the lakes and rivers of the Lake Melville district in southeastern Labrador (Fig. 1).

THE COAST LINE

The route traversed in going north last season (1921) included a stop at the Bay of Seven Islands near the head of the Gulf of St. Lawrence. The heavy forests which reach the shore line at this point are being utilized by one of the largest pulp mills in Canada. The product of this mill goes to the Northcliffe papers in England.

From the intense heat of early July at the Bay of Seven Islands a short run brought the *Acadia* into the ice-cooled breezes of the Strait of Belle Isle. The first patches of snow were seen ashore near Mekatina Island on July 10. Ice fields, dotted occasionally with large bergs, were constantly alongside after we entered the Strait (Fig. 3).

With the appearance of ice on the sea comes the disappearance of forests on the shore. Bare rocky slopes without timber form the background of the southward-moving procession of bergs and floe ice.

An endless variety of shapes are represented by the icebergs. Some, as a result of irregular melting on the surface, show a crater-shaped top filled with fresh water; others have sharp pinnacles and mountain-like outlines; still others have a slightly modified tabular outline. Occasionally a berg shows a huge arch running through it, representing probably a section of a glacier which has been carved by a subglacial stream. The general color of the bergs is the purest of white, but many show a fine delicate shade of green. A few have seams of bluish green ice running through the pure white of the main mass. Some observers are impressed by the architectural suggestion conveyed by icebergs. Cabot says that "Man's architecture in all its forms is hinted at, and often the forms of living creatures, natural or grotesque; but the spirit of the ice is mainly architectural: the gods of the North had their temples, and these are their fragments."

Under a clear sky the ice floes present a striking scene. The sun is reflected from thousands of cakes of floe ice of every conceivable shape, ranging in size from a few square feet to acres of surface and extending to the sky line a dazzling field of white. Probably no other coast line shows more striking and novel mirage effects than that of Labrador. The mirage often repeats the floe inverted. Sometimes the sharp-pinnacled bergs have resting upon them their duplicates inverted, the columns and pinnacles coalescing. At the horizon the mirage often gives the appearance of a solid vertical wall of ice encircling the ship.

The distorting effect of the mirage on the low rocky islands is very interesting and remarkable (Fig. 4). The White Bear Islands and many others along the coast are low, bare, rounded masses of rock. Under the magic influence of the mirage these are made to caricature all kinds of topography.

The mirage lifts up the insignificant ice-rounded hills into vertical-faced

cliffs presenting at times a vertical unbroken front of flat-topped cliffs for miles. At other times the low rocky points on the shore rise up as pillars of brown or gray rock, and these will spread out into gigantic mushrooms

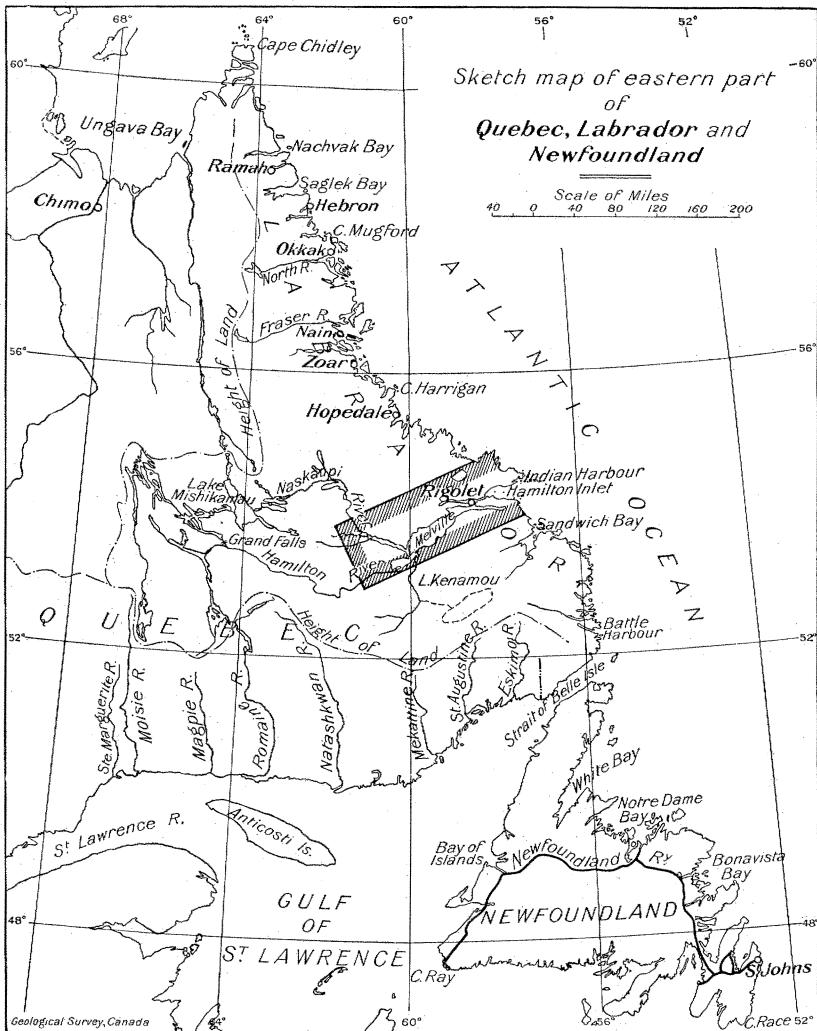


FIG. 1.—Sketch map of eastern Labrador.

with flat, pancake-like tops. The most common form produced by the mirage is the flat-topped mesa. But no form persists long, one type dissolving into another or giving way temporarily to the real aspect of the shore line. As one watches lofty vertical cliffs, sharply defined, rising from a low, barely visible shore, then melting away at the summits, and presently vanishing altogether, it is easy to imagine some invisible magician of the

deep, with age-long memories of the past, exhibiting some of the episodes in Labrador's geological history.

The bleak, time-eaten, rocky shores of the islands and mainland, to which the mirage gives such a variety of aspects, continue barren of trees, with a few trifling exceptions, from the western end of the Strait of Belle Isle to the vicinity of Sandwich Bay. An island in this vicinity with a few straggling spruces near the summit gave me the first hint that trees are to be found in Labrador. Other islands were seen in or near Sandwich Bay which had considerable patches of black spruce on shores which did not face the open sea. In general, however, forests are either absent on the seacoast or confined to the sides of ravines or small valleys where the topography affords some protection to timber.

HAMILTON INLET

Probably nowhere on the coast of Labrador can the transition from the barren outer islands to the forested interior be better seen than in Hamilton Inlet. This bay has a length of about 40 miles in an east-and-west direction and is dotted with numerous rocky islands. The eastern, or outermost, of these are clothed only with lichens, emerald green moss, and a considerable variety of flowering plants. Trees are entirely absent if we except a variety of arctic willow and a dwarfed birch which grow prostrate upon the ground, their branches seldom rising more than two or three inches above the rock crevices that protect their roots.

Fifteen miles to the westward the shores of the mainland and the islands begin to show patches of black spruce of a dwarfed type (Fig. 5). These show at a distance on the hill slopes as blotches of dark green on the light green of the moss-covered surrounding areas. The stunted spruce becomes somewhat larger, and the areas covered by it more extensive, as the head of the inlet is approached.

It is clear that the climatic condition resulting from floating ice is the main factor keeping the outer shores deforested. Great fields of ice persist in the outer parts of the Inlet till the latter part of July. Scattering ice cakes were seen 18 miles west of Indian Harbour near the extreme outer end of the Inlet on August 20. The ice, however, is seldom if ever seen in midsummer within many miles of Rigolet, which is situated near the head of the Inlet. Around this ice-free part of the Inlet the forests clothe a large part of the land surface; and the trees, though small, make up dense forests.

THE INTERIOR

After becoming familiar with the dwarfed spruce forests along the shores about the head of Hamilton Inlet, with trees 15 to 35 feet high, one is hardly prepared for the great change in their character which occurs in the area around Lake Melville, lying just west of the head of Hamilton Inlet. At Rigolet the visitor may see squared timbers used for hauling out vessels that would be considered creditable representatives of any Canadian forest.



FIG. 2



FIG. 3



FIG. 4

FIG. 2—A typical view of the treeless shore zone on "the Labrador." Note the houses high up the slopes.
 FIG. 3—View from the bridge of the S.S. *Acadia*, taken in July, showing floe ice and patches of snow on Labrador hills.

FIG. 4—Low islands on the Labrador coast surrounded by ice floes in July. The shores assume many fantastic and astonishing shapes under the influence of the mirage.

One of these was measured by the writer. The figures are: length, 59 feet, butt dimensions, 1 foot 4 inches by 9 inches; dimensions at small end, 9½ by 6½ inches. This piece of timber, which was cut near the head of the lake, is considerably larger than any timber near the seashore.

Black spruce (*Picea mariana*) is the dominant tree throughout the Lake Melville district (Fig. 5), but white spruce becomes increasingly common as one proceeds inland. The white birch (*Betula pendula*) is a very common tree, and in tracts which have been burned over it has taken possession of the ground to the exclusion of all other trees. The largest specimens of the birch observed, however, were seen where they occurred sparingly in forests of black and white spruce.

Where the birch constitutes the whole of the forest, as it often does over tracts which have been burned, its light green foliage distinguishes it at considerable distances from the darker evergreen forests. The forest color effects vary greatly with the illumination and the distance from the observer. Under a gray sky the black spruce forests are nearly black in the middle distance, dark green in the foreground, shading off into deep dark blue in the distance. Under a half-clouded sky the forested mountain slopes are marked with blotches of dark blue on a field of light green, the color scheme changing constantly with the shifting of the clouds. Sometimes at the finish of a shower a spruce-covered island, rainbow-arched, will furnish a picture not easily forgotten. Labrador has been described as the land of rainbows; the dozen or more daily showers often experienced during the past summer seem to justify the title.

In many places in the Labrador forest the ground is mantled by a carpet of sphagnum moss into which one sinks to the knees. When this is absent caribou moss often replaces it. Where the trees are not too closely spaced the ashen gray of the caribou moss gives a color contrast to the dark green of the black spruce visible at a considerable distance. Nearly everywhere the white blossom of the Labrador tea is seen during July. As its blossoms fade the dark pink lambkill takes its place, decorating the woods with a profusion of delicate color throughout the latter part of the summer. About the first of August the half-ripe low-bush cranberries begin to show rosy cheeks above the moss, and a little later the rich dark purple bearberries and blueberries spread a feast of delicious fruit and ravishing color on the gray rocky summit of every hill and mountain. The wild currant, the crowberry, and the baked-apple are among the other refreshments which the forests set before their visitors. Alder and willow generally form the forest border along the streams. The fragrant-leaved sweet gale is also frequently seen about the margin of the forests.

The principal trees in the approximate order of their abundance in the Lake Melville district are: black spruce (*Picea mariana*, B. S. P.); white, or canoe, birch (*Betula pendula* Roth, var. ?); tamarack (*Larix laricina*, Koch); fir (*Abies balsamea*, Mill.); white spruce (*Picea canadensis*, B. S. P.); balsam poplar (*Populus balsamifera*, L.); yellow, or gray, birch (*Betula*

lutea, Michx. f.); black, or white, birch (*Betula lenta*, L.); trembling poplar, or aspen (*Populus tremuloides*, Michx.); ground juniper (*Juniperus communis*, L., var. *depressa*, Pursh.).

The fir, white spruce, and black spruce are the trees which have been used for lumber in the region. Both the white and the black spruce reach a large size in many localities. The following figures indicate the character of some of the larger trees in these Labrador forests. On Mulligan River a black spruce measured 5 feet 6 inches in circumference 20 inches above the ground. Another black spruce on the Kenemich River measured 9 feet 10



FIG. 5—Black spruce forest near the eastern end of Lake Melville, Labrador. Much larger timber is found farther from the seacoast.

inches in circumference: its fine straight trunk appeared to be 100 feet high. The black spruce here probably reaches a greater average size than in Nova Scotia. At the head of Grand Lake a spruce in the driftwood had a diameter of 25 inches. A white birch on the Kenemich measured 5 feet 1 inch in circumference. These figures represent a few of the largest trees seen, but many others nearly or quite as large were observed. A large proportion of the forest trees approach these figures closely enough to furnish a large supply of logs suitable for lumber. The mountain slopes carry vast quantities of smaller timber which will no doubt be used eventually for pulpwood.

Two large sawmills were started in the district several years ago. One of these is near the mouth of the Grand River; the other is at Carter's Basin. They have not been in operation during recent years, but this is not from any lack of good timber. At present only one small mill, with portable gasoline engine, is in operation (Fig. 8); it furnishes lumber for local use.

It may be noted here that this region is nearer the British and European market than is any part of the Maritime Provinces.

The shores of Lake Melville are bordered by a considerable area of relatively flat or slightly rolling land on which the best timber is found. This area extends up the Grand River to Muskrat Falls, 25 miles above the mouth, and beyond (Fig. 6). On the mountain slopes much smaller trees occur.

Grand Lake, which lies northwest of Lake Melville and empties its waters into it, is without any lowland border, the mountains descending precipitously on the west and by gentle slopes on the east. This lake, which is about 30 miles long, was traversed in rainy weather when the forest-clad hills appeared and disappeared like huge gray ghosts through the foglike canopy which hung over the lake. At Cape Blanc, which is a steep-sided mountain rising abruptly from the lake, the scars of old avalanches are plainly visible. In some of these the timber and soil have both been stripped completely from the mountain face. In others in the midst of a black spruce forest, a belt of birch bounded sharply by perfectly straight lines tells the story of an old avalanche.

On the Nascaupsee River and the Red River the broad sand-and-clay terraces support a better forest growth than the Grand Lake basin. My own observations in this valley extended up to its junction with the Red River and a day's journey up the Red. Mrs. Leonidas Hubbard, who traversed the entire length of the Nascaupsee, reports one of the trees seen to have a circumference of nine feet. She states that "the valley is mostly well wooded with spruce and balsam as far as Mabelle Island, and here the spruce reaches splendid size."¹

Bryant and Turner have explored parts of the region south of the Lake Melville basin which my expedition did not enter. The rivers traversed by them enter the Gulf of St. Lawrence between the Mingan Islands and the Strait of Belle Isle. Townsend writes of the timber along the Natashquan valley, nearly opposite the eastern end of Anticosti, as follows.

The forest trees gradually increase in size from the coast where in places, as on the plateau back of the little village of Natashquan, they are nearly prostrate, to this point where they appear to have reached about their maximum and attain a height of 50 or 60 feet. Black spruce and balsam fir are the predominating trees, but white spruce are not uncommon. White birches are scattered here and there and often form pale green patches in a sea of dark spruces and show where a fire has swept through. Mountain ashes are few and far between as well as aspens, but, on the borders of the river, alders and dwarf willows are common. Of larches only a few remnants are left of this once abundant tree. Some years ago a devastating worm—the larva of a sawfly—swept through the country, and the larches were nearly exterminated. At Rigolette on Hamilton Inlet I had seen in 1906 the larches covered with these worms. Fortunately in this region of the Natashquan, at least, there are enough scattered veteran larches left to perpetuate the race, and vigorous seedlings are growing up, and I saw nothing of the worm.

The largest balsam fir I measured at this place close to the 5th Falls was 64 inches in circumference three feet from the ground. A black spruce was 43 inches, a white birch

¹ *Bull. Amer. Geogr. Soc.*, Vol. 38, 1906, p. 533.

was 72 inches. The white birches are rough and lichen-stained—gray and green and black—and the bark peels off in great rolls and hangs all over the trunk in rags.²

The observation of Townsend that the trees on the Gulf coast can survive only as prostrate dwarfs corresponds with the conditions which may be observed further east and north.

The St. Augustine River, which enters the Gulf of St. Lawrence 150 miles east of the Natashquan River, was ascended to the Height of Land in 1912 by Henry G. Bryant. Concerning the forests observed on this expedition Bryant writes as follows.



FIG. 6—View looking down Grand River from Muskrat Falls.

Referring to the timber resources of the region traversed, it may be of interest to mention that for the first twenty-five miles above the mouth the hills rising from the broad valley of the river are covered with a thick mantle of firs and spruces of small size and growing in the close formation so characteristic of the Laurentide landscape. These growths of the lower valley are suitable for pulp manufacture but, aside from this, possess little commercial value. For the next twenty-five miles to the vicinity of the first falls the size of the two varieties mentioned improves, and many scattered groves of birches are observed. Beyond this for about twenty miles a noticeable increase in size and quality of the spruces is apparent, while the firs have become a less important element in the forestation. While the best timber is not continuous here, many tracts may be seen containing trees which measure, three feet from the ground, something over two feet in diameter. . . .

In the neighborhood of the Height of Land the country is more open, while the tops of the ridges are often quite bare. Some of the finest spruce timber encountered on the journey was found in small groves in sheltered localities within a few miles of the lake sources of the river.³

² C. W. Townsend: A Short Trip into the Labrador Peninsula by Way of the Natashquan River, *Bull. Geogr. Soc. of Philadelphia*, Vol. 11, 1913, pp. 170-182; reference on p. 175.

³ H. G. Bryant: An Exploration in Southeastern Labrador, *Bull. Geogr. Soc. of Philadelphia*, Vol. 11, 1913, pp. 1-15; reference on pp. 13-14.

The Labrador and Alaska peninsulas on opposite sides of the continent are nearly equal in size and are in some degree comparable in the distribution of their forests. A large part of the Labrador shore line, like that of Alaska, is barren of forests. In both peninsulas the barren zone is widest along the northern shore line. In Alaska the barren shores of Seward Peninsula are replaced along the coast to the southeast by the heavy forests of south-eastern Alaska and British Columbia. The wide barren zone of northern

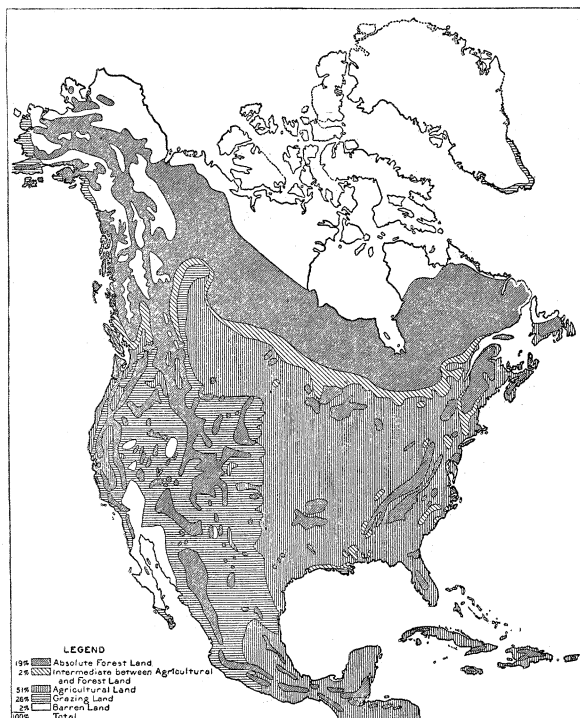


FIG. 7—Probable future land classification of North America.
(After Raphael Zon with modifications in eastern Labrador by E. M. Kindle.)

Labrador and the relatively narrow barren zone of eastern and southeastern Labrador give way in like manner toward the southwest to the spruce forests of the St. Lawrence River.

Examination of the accompanying map of the distribution of North American forests will show the very important rôle which Labrador will probably play in supplying forest products for the world market of the future. The Lake Melville waterways are of peculiar importance in this connection because they afford about 200 miles of navigable waters which are usable by seagoing vessels. These waterways include Lake Melville, Grand Lake, Double Mare, and Back Way. This penetration of the heart



FIG. 8



FIG. 9

FIG. 8—Sawmill on English River, Lake Melville.

FIG. 9—Indian canoe factory in the forest at Northwest River.

of the best of the Labrador forests by deep waterways must become an important element in keeping transportation costs at a low figure.

Canada is destined by its geological and geographical features to remain permanently the great forest country of North America. Compared with the area of the great forest belt extending from the Labrador coast to the Pacific, the widely scattered forest areas to the south of it appear insignificant in size (See Fig. 7). Lake Melville may reasonably be expected to become in the future one of the important eastern outlets for the forest products of the eastern portion of this vast forest zone.

FOREST BY-PRODUCTS

The forests of the Lake Melville region remain practically untouched. Lumber and other ordinary forest products, except as already noted, are not



FIG. 10—Eskimo family near the western end of Hamilton Inlet. The sparse forest seen at the left represents the dwarfed type of spruce commonly found near the eastern seaward limit of the forested zone.

at present produced in the Lake Melville region. The single portable mill now in operation supplies lumber only for local use, and much of this is still cut with the old hand whipsaws. Until the boundary question is settled and it is known whether Newfoundland or Canada has authority to grant timber concessions, it is not likely that any large attempt at timber or pulpwood production will be undertaken.

At present the forests supply only by-products in the shape of fur-bearing animals. In one sense the annual fur catch may be regarded as a forest by-product. The heavy forests produce what is said to be the finest grade of fur known in the north. The fur-bearing animals and the people of the region are both, strictly speaking, forest products since neither could exist in the region without the forests.

Minks, weasels, and martens are the more common fur-producing animals. Red, cross, silver, and white foxes are trapped—the last generally being found only near the coast. The otter, lynx, and beaver are also present.

This region is near the southern limit of the range of the polar bear, which is sometimes taken on the seacoast; but it, like the seal, belongs to the sea rather than to the forests.

Originally the region was divided between the Indian and the Eskimo. The latter is nearly extinct in the Hamilton Inlet region and southward. The Eskimo held the narrow seacoast strip—approximately the same narrow shore zone now occupied by the Newfoundland fisherman—while all the vast interior river and lake region belonged to the Indian. When either race overstepped the time-hallowed boundary between them, savage reprisals resulted. Battle Harbour is one of the names which has survived from the days when the Indian and Eskimo tried to revise the Labrador boundary with the tomahawk and the spear. From the region south of Hamilton Inlet the Eskimo has disappeared, and the Newfoundland



FIG. 11—Indians preparing evening meal at Northwest River.

fisherman has taken his place. The Indian still survives but lives as his ancestors did, except that canvas canoes and tents have supplanted the birch-bark canoe and the skin-covered tepee.

EVOLUTION OF THE "LIVEYERES"

In Labrador, as elsewhere on the northern frontier, natural selection is producing a type of man well adapted to a changing environment. This new type will in time supplant the Indian.

In a country where elemental conditions prevail as they do in Labrador natural selection is not an academic term but a stern reality. Nature undertakes to make of every man who claims a home in Labrador either a hunter or a fisherman. For the failures starvation waits just round the corner. The man who is a product of an environment where these two arts are not important or essential must, when he comes to Labrador, speedily acquire them unless he is able to maintain his connections with his old environment and its resources. Failure to do so means elimination by starvation. The tragic death of Leonidas Hubbard illustrates the remorseless way in which

this fundamental law works in this region. The operation of this relentless law is likewise seen in the case of the Indian when, every few years, the caribou is scarce or the fishing poor. For the Indian persistently refuses to learn the lesson of making provision for the future although his ancestors have experienced the famine demonstration hundreds of times.

The hardy French and English fishermen who came into the region a century and a half ago found it to their liking as did the agents of the Hudson's Bay Company who followed them. They and their successors have left as descendants a brown-skinned race of Indian or Eskimo extraction on the maternal side. These are the "Liveyeres," as they are called to distinguish them from the Newfoundland fishermen who do not "live here" but come and go with each fishing season. Unlike the Indian (Figs. 9 and 11) who is willing to starve but not to work when game is scarce or the caribou fails, the Liveyere is apt to have the industrious habits of his paternal ancestry. Many of them have comfortable cabins always well stocked with rifles and supplied sometimes with a few books and in one instance which I recall with a small organ. Throughout the summer they devote themselves to the salmon and trout fishing in Lake Melville and in winter to trapping. These brown-skinned sons of the forest are apparently oblivious to the existence of the insect pests. A man new to the country frequently finds his eyes swollen almost to blindness for the first three or four days, but the swelling passes away after a few days, and the initiate is then, as regards swollen features, more or less immune for the remainder of the season. I can claim a fairly intimate acquaintance with mosquitoes of both the Yukon and Mackenzie valleys but am prepared to take off my hat to the quiet efficiency of the Labrador black fly.

It is reported that the failure of one of the sawmills was due in part to the refusal of a shipload of laborers imported from Europe to labor after their arrival in the land of the black fly. It does not require much imagination on the part of anyone having a speaking acquaintance with this little insect to guess why these foreigners developed an intense longing for their homeland shortly after their arrival in Labrador. If the management of this mill had relied more on the French Canadian timber cruiser and lumberjack and the Liveyere, there might have been a different sequel to record concerning the venture.

The black flies and mosquitoes, on which my cook exhausted a new set of adjectives every day, were treated merely with silent contempt by my native guide. He never deigned to use either head net, tar dope, or adjectives against the flies which the deep-sea cook declared to be immeasurably more disturbing to his peace and happiness than any of the shipwrecks which had fallen to his lot in happier days. The Labrador native is in many cases a fine type of man, patient beyond belief, not only with the black fly but with the 60 per cent import duty assessed by Newfoundland on all of his food and clothing not taken from the forest or the sea. At the approach of winter he goes into the forest for the trapping season, sometimes with a companion

or with dogs, but frequently entirely alone and from 50 to 200 miles from any settlement. The solitary trapper ordinarily knows no other companionship for three or four months than that of the trees, the stars, and the aurora. If the trap line is a long one, four o'clock in the morning will find a good trapper on the trail. These men appear to be as perfectly adjusted to and satisfied with their environment as the foxes and the otters whose pelts they seek.